REMARKS

At the time the final office action was mailed, claims 1, 2, 4-20 and 22 were pending. The Examiner rejected all pending claims. Reconsideration of the application in view of the remarks set forth below is respectfully requested.

Rejections Under 35 U.S.C. § 102

The Examiner rejected claims 11 and 16 under 35 U.C.C. § 102 (b) as being anticipated by Wynne (U.S. Patent No. 5,517,191). Specifically, the Examiner stated:

> A. Claim 11, "A computer system [col.2, Lns. 52], comprising: a processor; and a video subsystem coupled to the processor, the video subsystem comprising: a plurality of digital-to-analog converters for a plurality of color channels of the video subsystem [col. 3, Lns. 43-49]; a video connector coupled to the plurality of digital-to-analog converters for connection to a monitor [shown in figs. 2 and 4]; and a non-volatile memory storing a plurality of digital character4ization values for the plurality of digital-to-analog converters [shown in fig. 2]" is disclosed by Wynne [supra as detailed]. Wherein "calibration circuit which permits adjustment via digital commands [col. 2, Lns. 26-27", wherein commands and data for ADV476, lines D0-D7 and P0-P7 [col. 6, Lns. 61-65] accomplishes this, is system located in CPU 22, Fig. 2 [col. 5, Lns. 46-47] when desk top publishers or4 other graphic software applications are used with the computer system 10 [col. 5, Lns. 42-43] which interconnects computer with a hard drive 12a and floppy disk drive 12b.
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> B. Per independent claim 16, this is directed to a system for the system of independent claim 11, and therefore is rejected to independent claim 11.

Further, in the " response to arguments," the Examiner stated:

> With regard to independent claims 11 and 16, Wynne discloses wherein "calibration circuit which permits adjustment via digital commands [col. 2, Lns. 26-27]", wherein commands and data for ADV476, lines D0-D7 and P0-P7 [col. 6, Lns. 61-65 accomplishes this, is system located in CPU 22, Fig. 2 [col. 5, Lns. 46-47] when desk

top publishers or other graphic software applications are used wit5h the computer system 10 [col. 5, lns. 42-43] which interconnects computer with a hard drive 12a and floppy disk drive 12b.

Applicants respectfully traverse this rejection. Anticipation under Section 102 can be found only if a single reference shows exactly what is claimed. *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 227 U.S.P.Q. 773 (Fed. Cir. 1985). For a prior art reference to anticipate under Section 102, every element of the claimed invention must be identically shown in a single reference. *In re Bond*, 910 F.2d 831, 15 U.S.P.Q.2d 1566 (Fed. Cir. 1990). To maintain a proper rejection under Section 102, a single reference must teach each and every element or step of the rejected claim. *Atlas Powder v. E.I. du Pont*, 750 F.2d 1569 (Fed. Cir. 1984) Thus, if the claims recite even one element not found in the cited reference, the reference does not anticipate the claimed invention.

The present application is directed to a method of characterizing digital-to-analog converters (DAC) in a video subsystem having a non-volatile memory wherein DAC characterization data may be stored. Paragraph 8, lines 17-20. In one exemplary embodiment, the non-volatile memory may comprise an electrically erasable programmable read-only memory (EEPROM). Paragraph 8, lines 20-21. During manufacture of the video subsystem, each DAC that will be incorporated into the video subsystem is tested and characterization data for each DAC is obtained. DAC characterization data may be acquired from the DAC by providing predetermined digital input values into the DAC and measuring the voltage at the output of the DAC. *See* e.g., paragraphs 11, 13 and 14. The digital output data is stored in the non-volatile memory and serves as characterization data for the analog performance of the DACs. Paragraph 13, lines 19-22. The characterization data is stored in the non-volatile memory before or during manufacture and may be accessed during operation

of the video subsystem such that color management software may be implemented to perform color correction or optimization using the digital characterization data. Paragraph 9, lines 1-4; paragraph 11, lines 15-21.

Claims 11 and 16 each recite a video subsystem comprising "a non-volatile memory storing a plurality of digital characterization values for the plurality of digital-to-analog converters." The Wynne reference does not disclose this recited feature. The Wynne reference discloses a digitally controlled calibration circuit wherein an output signal from a DAC is calibrated by implementing a feedback loop. Specifically, the Wynne reference discloses providing a secondary calibration DAC whose output is fed back through a reference network to the primary DAC when the system is in calibration mode. Col. 4, lines 58-63. The primary DAC is adjusted or calibrated by entering a keyboard command to provide a digital signal to the secondary calibration DAC to modify its output current, thereby calibrating the primary DAC. Col. 4, line 63-Col. 5., line 6. Adjustments to the secondary calibration DAC, which in turn initiate calibration of the primary DAC, are only implemented based on the entry of commands via a keyboard, touch-screen or mouse while the system is in the calibration mode. Col 5, lines 6-8.

In stark contrast to the present disclosure, the Wynne reference simply discloses a system wherein the DACs may be calibrated by a user entering commands (via a keyboard, for example) during a calibration mode of the video subsystem. The Wynne reference does not disclose accessing a non-volatile memory device in the video subsystem when the video subsystem first begins operation, in accordance with the present invention. The Wynne reference only discloses a system wherein commands are entered to calibrate the DAC. Accordingly, the Wynne reference does not disclose storing characterization values, at all,

much less "a non-volatile memory storing a plurality of digital characterization values for the plurality of digital-to-analog converters," as recited in claims 11 and 16.

The Examiner cites Fig. 2 as disclosing the presently recited non-volatile memory. Applicants traverse this assertion. While Fig. 2 of the Wynne reference illustrates a hard drive 12A and a floppy disk drive 12B, the drives 12A and 12B can hardly be considered part of the video subsystem, as in claims 11 and 16. Even if the drives 12A and 12B could be characterized as the non-volatile memory of a video subsystem, there is nothing in the Wynne reference to suggest that digital characterization values for the DACs are stored on the drives 12A and 12B. As discussed above, the Wynne reference does not disclose storing digital characterization values, at all, since there is no need to store such values in accordance with the calibration techniques disclosed in the Wynne reference. As discussed above, in accordance with Wynne, calibration commands are entered by a user while the system is in a calibration mode and adjustments to the primary DAC are made through use of the secondary calibration DAC. The Examiner failed to cite where in the Wynne reference a non-volatile memory is disclosed or where in the Wynne reference *any* device for storing characterization values is disclosed. Applicants respectfully submit that the Wynne reference *does not* disclose such features.

Applicants firmly assert that the Wynne does not disclose, "a non-volatile memory storing a plurality of digital characterization values for the plurality of digital-to-analog converters," as recited in claims 11 and 16. Because the Wynne reference fails to disclose all of the elements recited in claims 11 and 16, the Wynne reference cannot possibly anticipate these claims. Accordingly, Applicants respectfully request withdrawal of the Examiner's rejections and allowance of claims 11 and 16.

The Examiner rejected claims 1, 4, 5 and 20 under 35 U.S.C. § 102 (b) as being anticipated by Zalph (U.S. Patent No. 5,245,326). Specifically, with respect to the independent claims, the Examiner stated:

> A. Zalph discloses claim 1, "A method of characterizing a plurality of digital-to-analog converters for a plurality of color channels of a video subsystem of a computer system, the method comprising the steps of: driving the plurality of digital-to-analog converters with a set of predetermined input digital values; measuring a plurality of output analog voltages of the plurality of digital-to-analog converters in response to the driving step [col. 4, lns. 29-45]; and storing a plurality of digital characterization values corresponding to the plurality of output analog voltages in a non-volatile memory of the video subsystem such that the digital characterization values are permanently stored in the non-volatile memory [col. 5, lns. 11-30" as [detailed]. Wherein liquid crystal display system corresponds to a video system.
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> B. Per independent claim 20, this is directed to a method for performing the method of independent claim 1, and therefore is rejected to independent claim 1, particularly in col. 4, lns. 42-45.

Applicants respectfully traverse this rejection. As discussed above, the present application discloses measuring certain values on a DAC to specifically characterize that particular DAC. Once that particular DAC is characterized, the characterization data for that particular DAC is stored in a non-volatile memory device during manufacture of the memory not in claim subsystem. Once the values are stored in the non-volatile memory, those DACs that were individually and uniquely characterized are incorporated into the video subsystem. During later operation of the DACs, the characterization data uniquely corresponding to each of the respective DACs in the video subsystem may be accessed via the non-volatile memory device.

Claim 1 recites characterizing "a plurality of digital-to–analog converters for a plurality of color channels of a video subsystem," comprising the steps of "driving the plurality of digital-to-analog converters," "measuring a plurality of output analog voltages of the plurality of digital-to-analog converters," and "storing a plurality of digital characterization values corresponding to the plurality of output analog voltages." Similarly, independent claim 20 recites "characterizing a plurality of color channels of a video subsystem," comprising "driving the plurality of color channels," "measuring a plurality of output analog signals of the plurality of color channels," and "storing a plurality of digital characterization values corresponding to the plurality of output analog signals voltages." As recited in the present claims, the characterization of the digital-to-analog converters (claim 1) and of the color channels (claim 20) are made by implementing the digital-to-analog converters or color channels *of the video subsystem*. That is to say, the characterization of the digital-to-analog converters and color channels is performed on those digital-to-analog converters and color channels which are implemented in the video subsystem itself.

In contrast, the Zalph reference simply discloses *modeling* digital-to-analog converters that are implemented in an LCD system using similar digital-to-analog converters in a calibration system. Specifically, the Zalph references discloses an LCD system 62 having a plurality of D/A converters 92 and a separate calibration system 96 having D/A converters 106 which "have the same conversion characteristics as those of converter 92 so that the analog output values thereof will be the same for a given digital input value." Col. 4, lines 1-3. Prior to the start of calibration, the calibration system 96 is connected to the LCD system 62, thereby connecting the converters 106 to the system 62. Col. 4, lines 29-35. Once the output voltages are measured through the D/A converter 106 (which are in the calibration system 96 and *not* the LCD system 62), the measurements are stored in the RAM 114 of the

calibration system 96. Col. 4, lines 33-42. Finally, the digital values are stored in the NVRAM 93 of the LCD system 62, such that after completion of calibration when the LCD system 62 is first turned on, the output voltages may be accessed in the NVRAM 93. Col. 5, lines 11-18.

As explicitly described throughout the Zalph reference, the D/A converters 92 which are actually implemented in the LCD system *are not* measured at any point. Rather, a calibration system 96 having D/A converters 106 that have the same conversion characteristics as the D/A converters 92 are implemented to *model* the behavior of the converters 92. As described in the background of the present application, modeling the behavior of one DAC to predict the behavior of another DAC may provide inaccuracies and imprecision in the color channels of the video system. Even though each DAC may have similar characteristics and may use the same voltage source as a common reference, each DAC may not produce the same output voltage in response to the same digital input value. Specification, page 2, lines 3-9. Accordingly, the imprecision introduced by the system disclosed in the Zalph reference is one of the types of systems that the present invention is directed to improving. As recited in claims 1 and 20, each of the characterization steps that is performed is performed on the specific DACs which will be implemented in the video subsystem. The Zalph reference does not disclose such features.

Because the Zalph reference does not disclose each of the elements recited in claims 1 and 20, the reference cannot possibly anticipate those claims or those claims dependent thereon. Accordingly, applicants respectfully request withdrawal of the Examiner's rejection and allowance of claims 1, 4, 5 and 20.

Rejections Under 35 U.S.C. § 103

The Examiner rejected claims 2 and 6-10 under 35 U.S. C. § 103 (a) as being unpatentable over Zalph in view of Thomson (E.P. Pat. No.0780986A2). Further, the Examiner rejected claim 22 under 35 U.S.C. § 103 (a) as being unpatentable over Zalph in view of Wynne. Finally, the Examiner rejected claims 12-15 and 17-19 under 35 U.S.C. § 103 (a) as being unpatentable over Thomson in view of Wynne. Applicants respectfully traverse these rejections.

The burden of establishing a *prima facie* case of obviousness falls on the Examiner. *Ex parte Wolters and Kuypers*, 214 U.S.P.Q. 735 (PTO Bd. App. 1979). Obviousness cannot be established by combining or modifying the teachings of the prior art to produce the claimed invention absent some teaching or suggestion supporting the combination or modification. *See ACS Hospital Systems, Inc. v. Montefiore Hospital*, 732 F.2d 1572, 1577, 221 U.S.P.Q. 929, 933 (Fed. Cir. 1984). Accordingly, to establish a *prima facie* case, the Examiner must not only show that the combination or modification includes *all* of the claimed elements, but also a convincing line of reason as to why one of ordinary skill in the art would have found the claimed invention to have been obvious in light of the teachings of the references. *See Ex parte Clapp*, 227 U.S.P.Q. 972 (B.P.A.I. 1985).

Each of the claims rejected under 35 U.S.C. § 103 is dependent on one of the claims previously discussed with reference to the rejections under 35 U.S.C. § 102. Applicants note that the Thomson reference does not cure the deficiencies discussed above with regard to the Zalph or Wynne references. Accordingly, none of the cited references either alone or in combination, discloses each of the elements recited in independent claims 1, 11, 16 and 20, on which the presently rejected claims depend. Accordingly, the cited references cannot

possibly render the present claims obvious for at least the reasons discussed above with reference to the rejections under 35 U.S.C. § 102. Applicants respectfully request withdrawal of the Examiner's rejections and allowance of claims 2, 6-10, 12-15, 17-19 and 22.

Conclusion

In view of the remarks set forth above, Applicants respectfully request allowance of claims 1, 2, 4-20 and 22. If the Examiner believes that a telephonic interview will help speed this application toward issuance, the Examiner is invited to contact the undersigned at the telephone number below.

Respectfully submitted,

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